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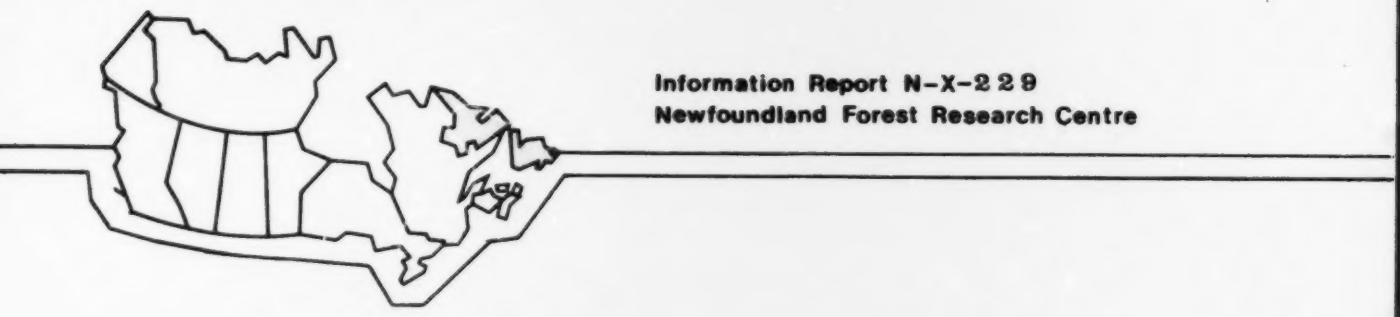
Forest insect and disease conditions in Newfoundland and Labrador in 1984

L. J. Clarke and G. C. Carew



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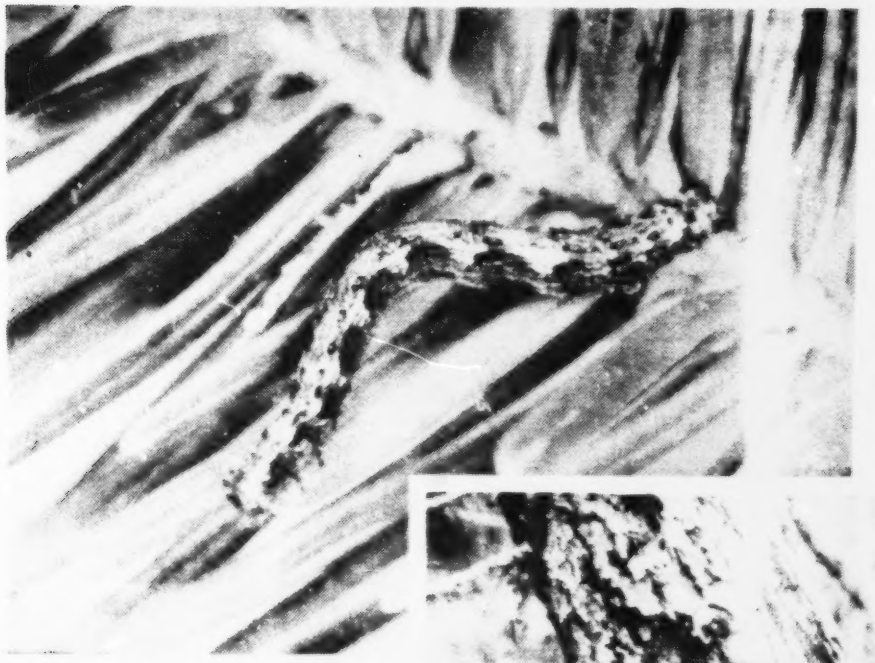

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COVER PHOTOGRAPHS

Full grown hemlock looper larvae feeding on balsam fir.

Heart rot in black spruce tree.

FOREST INSECT AND DISEASE CONDITIONS IN NEWFOUNDLAND AND LABRADOR IN 1984

by L.J. Clarke and G.C. Carew

INFORMATION REPORT N-X-229
1985

NEWFOUNDLAND FOREST RESEARCH CENTRE
CANADIAN FORESTRY SERVICE
AGRICULTURE CANADA

Minister of Supply and Services Canada 1985

ISSN No. 0704-7657
CAT No. FO46-15/229E
ISBN No. 0-662-14146-6

Copies of this report are available at no charge from:

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ABSTRACT

This report summarizes forest pest conditions in Newfoundland and Labrador in 1984 and was compiled from information collected in 12 Forest Insect and Disease Survey Districts. Major pests of fir, spruce, pine and larch forests and deciduous tree species are discussed in detail and pests of lesser importance are tabulated.

RÉSUMÉ

Ce rapport est un résumé de la situation des ravageurs forestiers à Terre-Neuve et au Labrador en 1984. Les renseignements qu'il contient proviennent du relevé des insectes et des maladies des arbres effectué dans 12 districts. Les ravageurs des forêts de sapin d'épinette, de pin et de mélèze et ceux des espèces feuillues font l'objet d'un exposé détaillé et les les ravagers de moindre importance sont présentés sous forme de tableau.

ACKNOWLEDGEMENTS

Information for this report is based on the results of surveys conducted by all personnel of the Forest Insect and Disease Survey and research officers of the Forest Protection Section. The cooperation of the Provincial Department of Forest Resources and Lands, providing technicians, casual workers, inventory maps and aircraft time for insect and disease assessment and the forest industry for providing inventory figures was greatly appreciated.

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FOREST INSECT AND DISEASE CONDITIONS IN NEWFOUNDLAND AND LABRADOR IN 1984

INTRODUCTION

This report summarizes forest insect and disease conditions in the forests of Newfoundland and Labrador in 1984 and forecasts conditions for 1985. The region is divided into 12 ranger districts with four district rangers responsible for detecting, monitoring and collecting forest pests, maintaining records and conducting surveys to support forest research and providing advisory services on forest pest and disease conditions to governments, industry and the general public. The information in this report was compiled from the observations and field records of the district rangers and other survey personnel. The Forest Insect and Disease Survey Districts and the Provincial Forest Management Units are included for reference (Figs. 1 and 2).

SUMMARY

The most destructive insects in the Province in 1984 were the hemlock looper, spruce budworm, four-eyed spruce bark beetle, balsam woolly aphid, yellowheaded spruce sawfly, spruce beetle, larch beetle, spruce bud midge and larch sawfly. The blackheaded budworm and several species of insects that attack seed cones caused some tree damage in the Province but to a lesser degree. A spruce bark beetle, Scolytus piceae and the northern spruce engraver, Ips perturbatus were new species collected for the first time in the Province. The birch

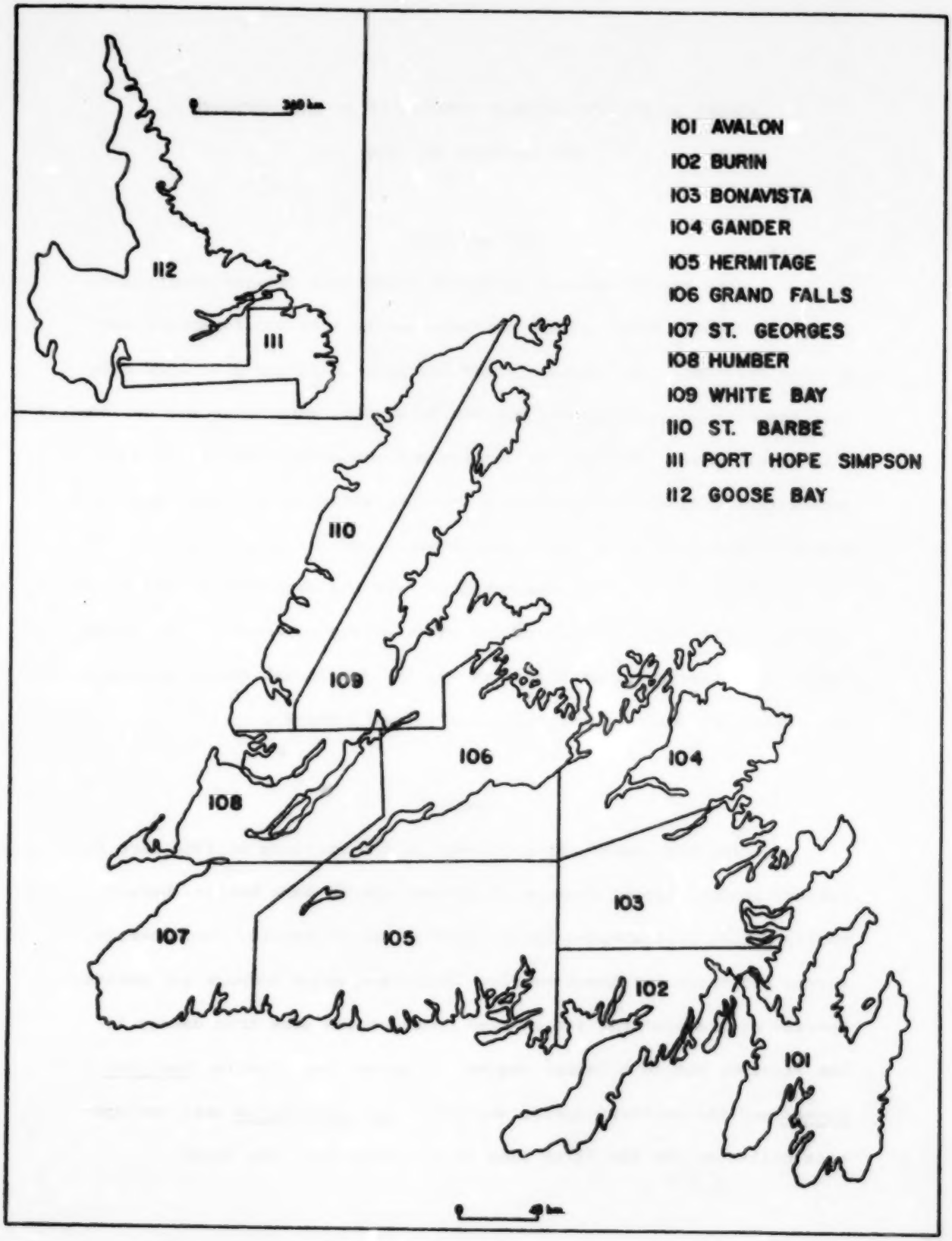

Fig. 1. Forest Insect and Disease Survey Districts.

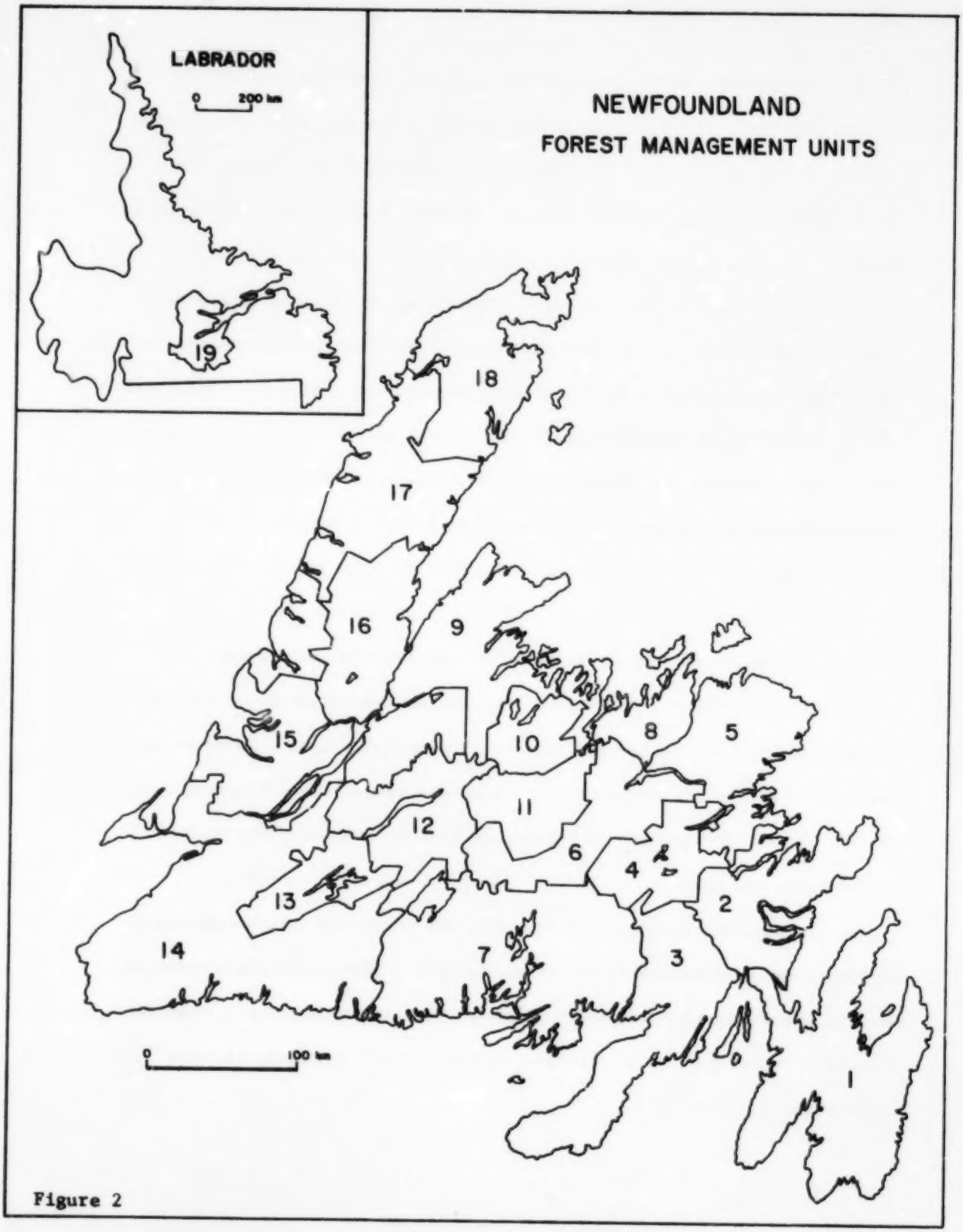
LABRADOR
0 200 km
19
NEWFOUNDLAND
FOREST MANAGEMENT UNITS
18
17
16
9
15
10
8
5
11
12
6
4
2
13
14
7
3
1
0 100 km

Figure 2

casebearer caused the most damage on hardwood trees as population levels remained high throughout the Island. The striped alder sawfly caused severe defoliation in western and central Newfoundland. The satin moth and birch leafminer were also very common and widespread in 1984.

Armillaria root rot was the most important tree disease in black spruce stands in central areas of the Island. Scleroderris canker of pines caused severe damage on ornamental pines in St. John's and on the Salmonier Line. Needle rusts, needle casts, witches' broom of black spruce, shoot and leaf blight of aspen, black knot of cherry, winter drying and frost damage also caused severe damage. Inland spruce cone rust, sirococcus shoot blight and scab and black canker of willow caused minor damage.

Aerial surveys were conducted in fixed-wing aircraft and helicopters in the productive forests of the Island to map defoliation, damage and collect branch samples to forecast the spruce budworm and hemlock looper outbreaks in 1985. Approximately 71 hours were flown during aerial surveys and 167 hours during egg sampling and damage assessment surveys.

Special surveys and studies were conducted on the spruce bud midge, cone insects and Armillaria root rot to assess their impact on spruce stands in central Newfoundland. Surveys to develop a reliable sampling technique for predicting hemlock looper populations were undertaken in late fall.

Monitoring of the introduced shrew continued in four permanent plots throughout the Island (Table 4).

SPRUCE AND FIR PESTS

Spruce budworm, Choristoneura fumiferana (Clem.) - The area of moderate and severe defoliation forecast for 1984 on the Island was 55 000 ha with an additional 81 000 ha in the light category. These areas of defoliation were distributed mainly in western Newfoundland from O'Regans to South Branch, near Corner Brook, Hughes Brook, Glide Lake, Big Falls on the Humber River and Middle Arm Brook on the Baie Verte Peninsula and along Noel Paul's Brook in central Newfoundland (Table 1, Fig. 3).

Cool, wet weather prevailed throughout most of June and caused larval development to be about two weeks later than in 1983 and many patchy infestations collapsed. The total area of moderate and severe defoliation in 1984 was about 15 300 ha with 7 300 ha in the light category, a decrease from the 68 000 ha and 32 000 ha respectively in 1983.

The biological survey was continued in 1984 and spruce budworm larvae were collected weekly and totalled over 1700 larvae and pupae. These larvae were reared in the laboratory to determine the percentage of parasitism and disease. The major larval parasites were

Table 1. Area (ha) of defoliation caused by the spruce budworm in productive forests of Newfoundland in 1984.

Management Unit No.	Defoliation Class[1]			
	Light	Moderate	Severe	Total
9	2 370	-	3 609	5 979
12	806	311	2 717	3 834
14	414	-	6 882	7 296
15	3 712	656	1 108	5 476
	7 302	967	14 316	22 585

[1]Light - 1-25%
Moderate - 26-75%
Severe - 76-100%

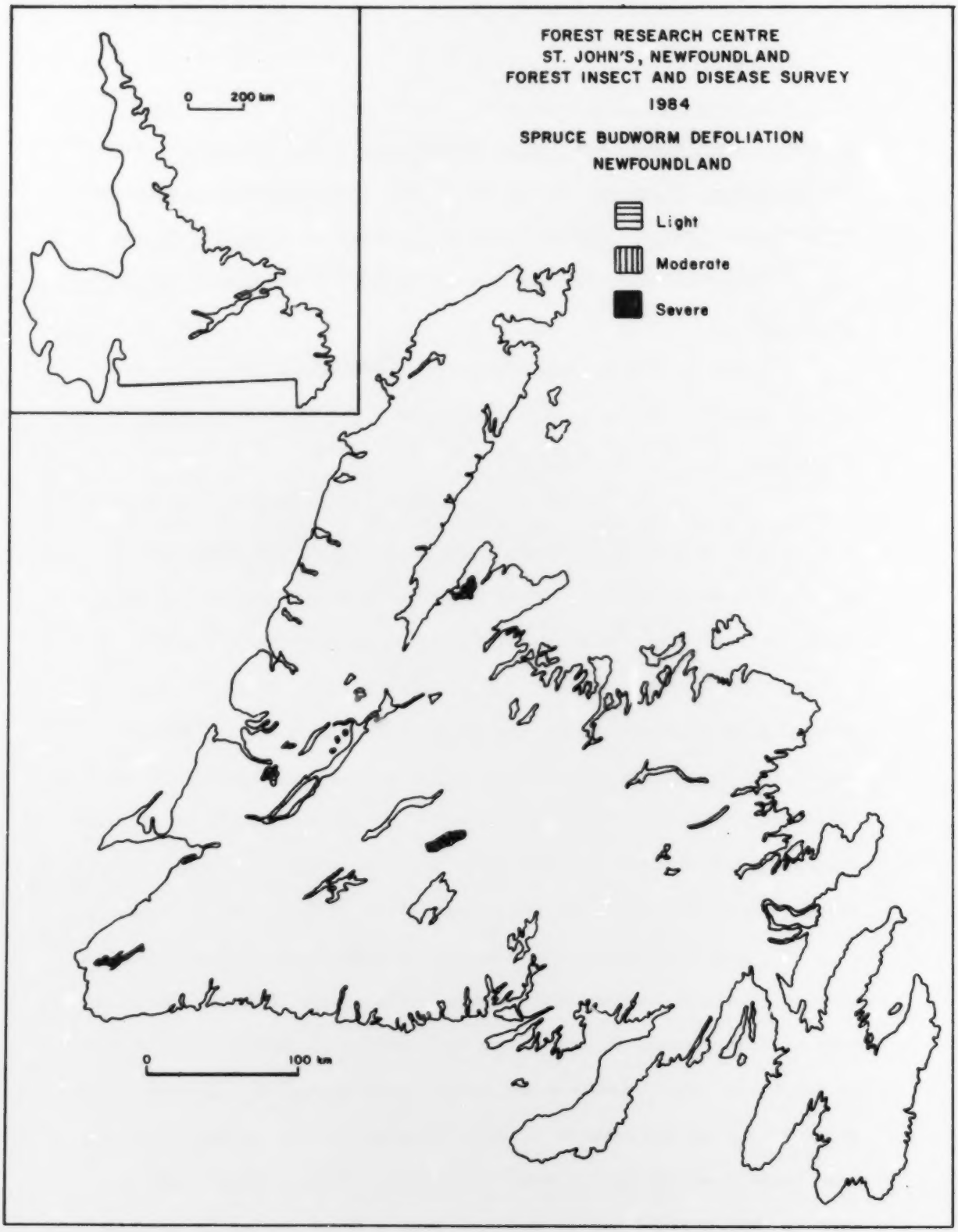

Figure 3. Areas of defoliation by the spruce budworm in Newfoundland in 1984.

Apanteles fumiferanae and Glypta fumiferanae. The major pupal parasite was Phaeogenes hariolus. About 11% of the spruce budworm sampled were parasitized. Fungal diseases caused less than 1% mortality of the reared budworm larvae. The most common fungal pathogen was Paecilomyces farinosus.

The Provincial Department of Forest Resources and Lands treated about 23 200 ha with Matacil and 3 110 ha with Bacillus thuringiensis.

Traditionally, the Forest Insect and Disease Survey reported tree mortality in forest stands. During the past four years this assessment was conducted jointly with the Inventory Section of the Department of Forest Resources and Lands. In 1984 the Provincial Department was solely responsible for the reporting. However, less intensive surveys conducted by the Forest Insect and Disease Survey showed that the areas with more than 10% tree mortality did not increase from the 389 000 ha of balsam fir stands and 96 000 ha of black spruce stands reported in 1983 (Fig. 2). The total volume of these stands was estimated 40 441 000 m^3 and 10 323 000 m^3 respectively.

Egg mass samples were collected from about 300 locations in 1984 primarily in western and central areas of the Island. The total area of light, moderate and severe defoliation is forecast to be about 63 000 ha in 1985. Moderate and severe defoliation is expected to be about 29 300 ha distributed in isolated areas in the Codroy Valley, near Sandy Lake and on the Baie Verte Peninsula near Middle Arm in western Newfoundland and in the Noel Paul's Brook Valley in central Newfoundland (Table 2, Fig. 4).

Table 2. Area (ha) of light, moderate and severe defoliation forecast in productive forests by the spruce budworm in 1985.*

Management Unit no.	Ownership	Defoliation Category[1] Light	Moderate and severe	Total
9	Bowater	-	15 918	15 918
12	Abitibi-Price	-	7 394	7 394
14	Crown	3 259	-	3 259
14	Bowater	9 777	4 400	14 177
15	Bowater	6 222	-	6 222
16	Bowater	14 645	1 590	16 235
	Crown	3 259	-	3 259
All	Bowater	30 644	21 908	52 552
	Abitibi-Price	-	7 394	7 394
Total		33 903	29 302	63 205

*Forecast based on egg mass and overwintering larval surveys.

[1]Light - 1-25%
Moderate - 26-75%
Severe - 76-100%

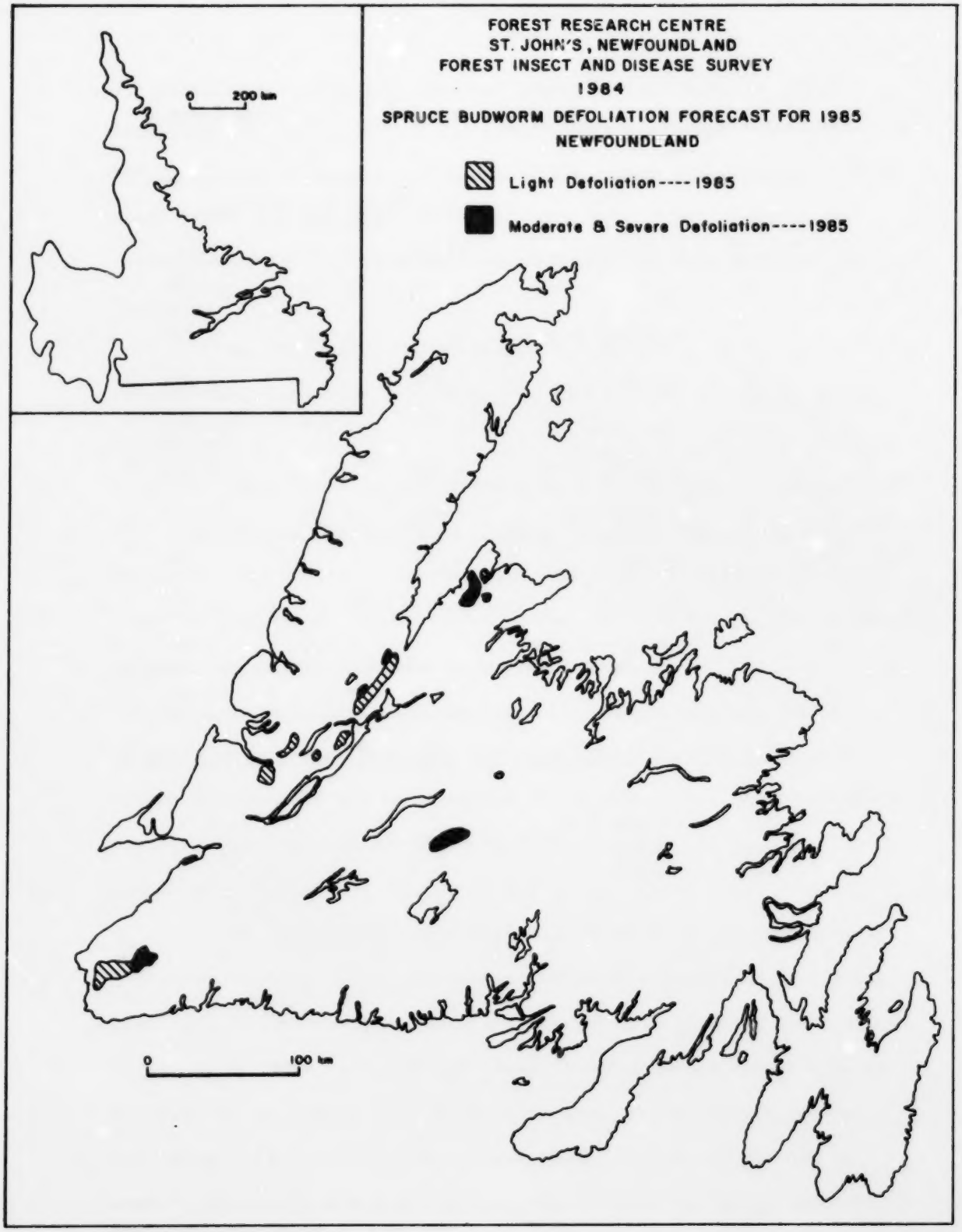

Figure 4. Areas of spruce budworm defoliation forecast for 1985 in Newfoundland.

Light defoliation is forecast to occur on about 24 000 ha in the Codroy Valley, near Corner Brook, Deer Lake, Middle Arm and a new infestation in the Upper Humber River Valley.

The infestation in Labrador collapsed this year and no defoliation is expected in 1985.

Population levels indicated by the number of egg masses per 10 m^2 of foliage are expected to be about 157 in the moderate defoliation category and 324 in the severe (Table 3).

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) - There were six outbreaks of the looper recorded in Newfoundland since the turn of the century. The most recent outbreak occurred from 1966 to 1972 and was the largest and most severe ever recorded causing 8 600 000 m^2 of tree mortality. Application of chemical insecticides were necessary in 1968-69 to control the outbreak.

Seasonal development of the looper follows that of the spruce budworm by about a month. The cool, wet weather in June 1984 had little affect on looper populations but the warm, dry weather in July favoured looper development and survival.

Population levels of the hemlock looper have been increasing gradually during the past few years in many locations of the Island. In 1983 two infestations were reported; one on the Avalon Peninsula on about 9000 ha from Markland along Rocky River to the coast and the other in the Bay d'Espoir area on about 200 ha extending from Swanger Cove to St. Joseph's (Fig. 5). These two infestations expanded considerably in 1984. The one on the Avalon Peninsula increased to about

Table 3. Summary of spruce budworm eggmass numbers per 10 m^2 of foliage for sample points with moderate and severe defoliation forecast in Newfoundland from 1978 to 1984.

	Moderage Defoliation Forecast*		Severe Defoliation Forecast*	
Year	Number sample points	Average EM/10 m^2	Number sample points	Average EM/10 m^2
1984	2	157	1	324
1983	4	117	4	301
1982	10	147	7	379
1981	4	129	4	440
1980	49	149	123	437
1979	65	149	149	438
1978	72	154	124	491

*Class limits for defoliation forecast based on egymasses per 10 m^2 of foliage:

Defoliation forecast

Nil	0%
Light	1-25%
Moderate	26-75%
Severe	76-100%

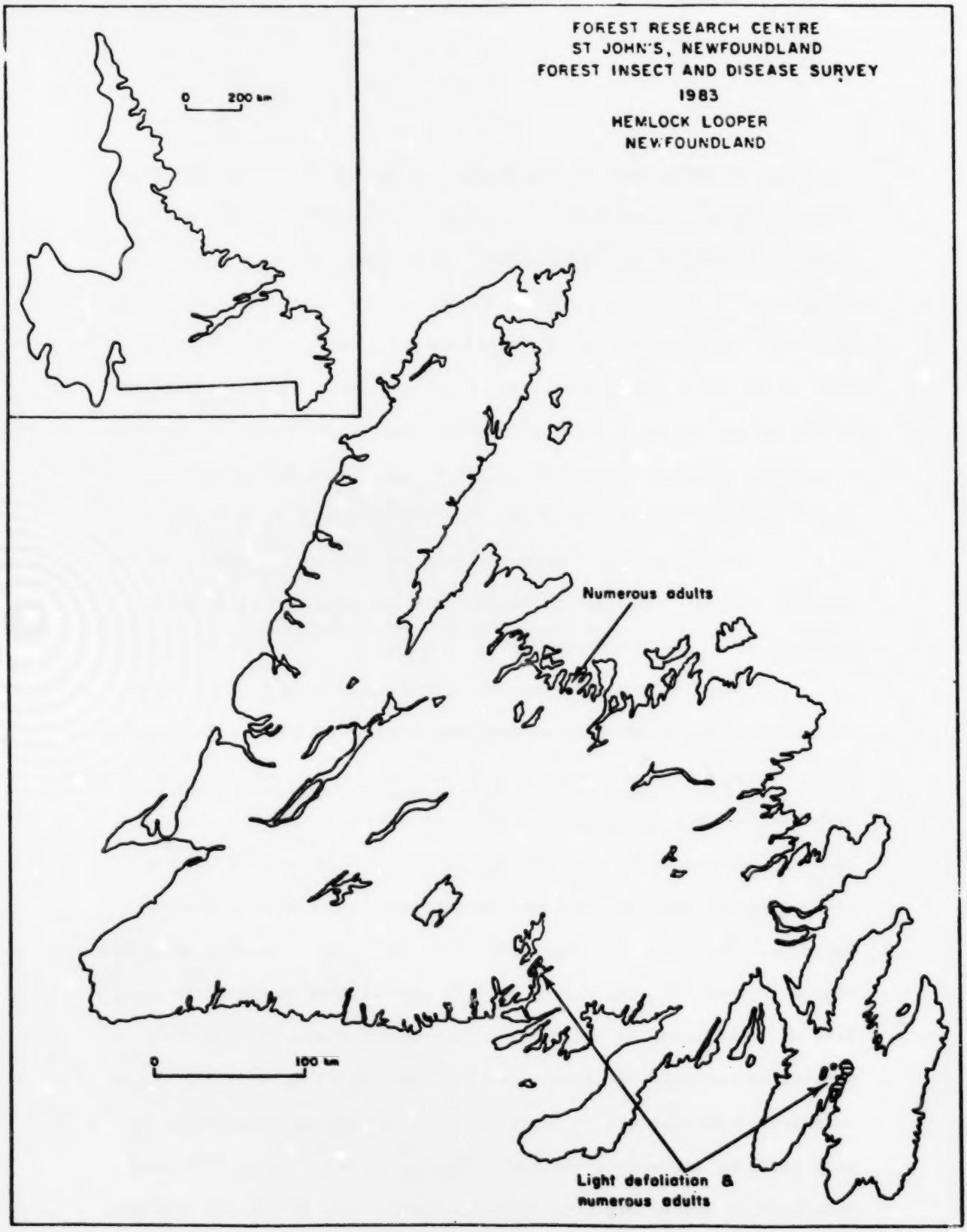

Figure 5. Areas of defoliation by the hemlock looper and abundant looper moths in Newfoundland in 1983.

57 000 ha covering most of the forested area and the other near Bay d'Espoir increased to 13 300 ha around the Bay and north along the Bay d'Espoir Highway to Bernards Brook. In addition separate areas of defoliation occurred in numerous locations in central and eastern Newfoundland. The total area of defoliation was approximately 95 000 ha with 53 000 ha in the moderate and severe category and the remaining 42 000 ha in the light defoliation class (Table 4, Fig. 6). No measurable amount of tree mortality was caused by the hemlock looper on the Island and no looper larvae were collected in Labrador in 1984.

Larval and pupal parasitism of the looper averaged 3.5% and 10% respectively. Disease organisms were not observed in laboratory rearings or in the field samples.

Based on the distribution of severe defoliation and subsequent intensive larval and egg sampling in most of the immature and mature forested areas of the Island, moderate and severe defoliation is forecast to occur on about 273 000 ha of forest stands in 1985. This defoliation will be distributed in the Codroy Valley, from George's Lake to Steady Brook in western Newfoundland; from Bay d'Espoir to Berry Hill Pond, Great Rattling Brook to Seal Bay, Deer Pond to Little Dead Wolf Pond and near Rodney Pond in central Newfoundland; in the Lake St. John area, in the Terra Nova National Park and from Swift Current to Holyrood in eastern Newfoundland (Table 5, Fig. 7). Light defoliation is expected to occur on about 437 000 ha distributed in many isolated areas from the Codroy Valley to Baie Verte, from Snow Shoe Pond to Gander Bay from Gambo to Clarenville and on the Southern Shore of the Avalon Peninsula.

Table 4. Area (ha) of defoliation caused by the hemlock looper in productive forests of Newfoundland in 1984.

Management Unit No.	Defoliation Class[1]			
	Light	Moderate	Severe	Total
1	36 000	9 500	11 400	56 900
2	900	400	3 700	5 800
4	-	-	1 700	1 700
6	-	-	300	300
7	4 000	1 900	7 400	13 300
9	-	-	100	100
10	700	-	8 400	9 100
11	-	400	6 600	7 000
Total	41 600	12 200	39 600	93 400
TNNP	400	2	9	1 500
GRAND TOTAL	42 000	12 400	40 500	94 900

[1]Light - 1-25%
Moderate - 26-75%
Severe - 76-100%

Table 5. Hemlock looper defoliation forecast for 1985 in productive forest of Newfoundland.

Unit No.	Defoliation Class[1]		Total
	Light	Moderate and Severe	
1	49 900	31 900	81 800
2	50 400	11 500	61 900
4	2 200	17 700	19 900
5	12 300	1 300	13 600
6	13 800	17 200	31 000
7	-	38 200	38 200
8	27 000	4 700	31 700
9	22 100	5 300	27 400
10	4 600	53 000	57 600
11	38 300	48 700	87 000
12	78 200	-	78 200
14	57 100	9 400	66 500
15	61 100	25 700	86 800
16	20 000	-	20 000
Total	437 000	264 600	701 600
TNNP	-	8 000	8 000
GRAND TOTAL	437 000	272 600	709 600

[1]Light - 0-25%
Moderate - 26-75%
Severe - 76-100%

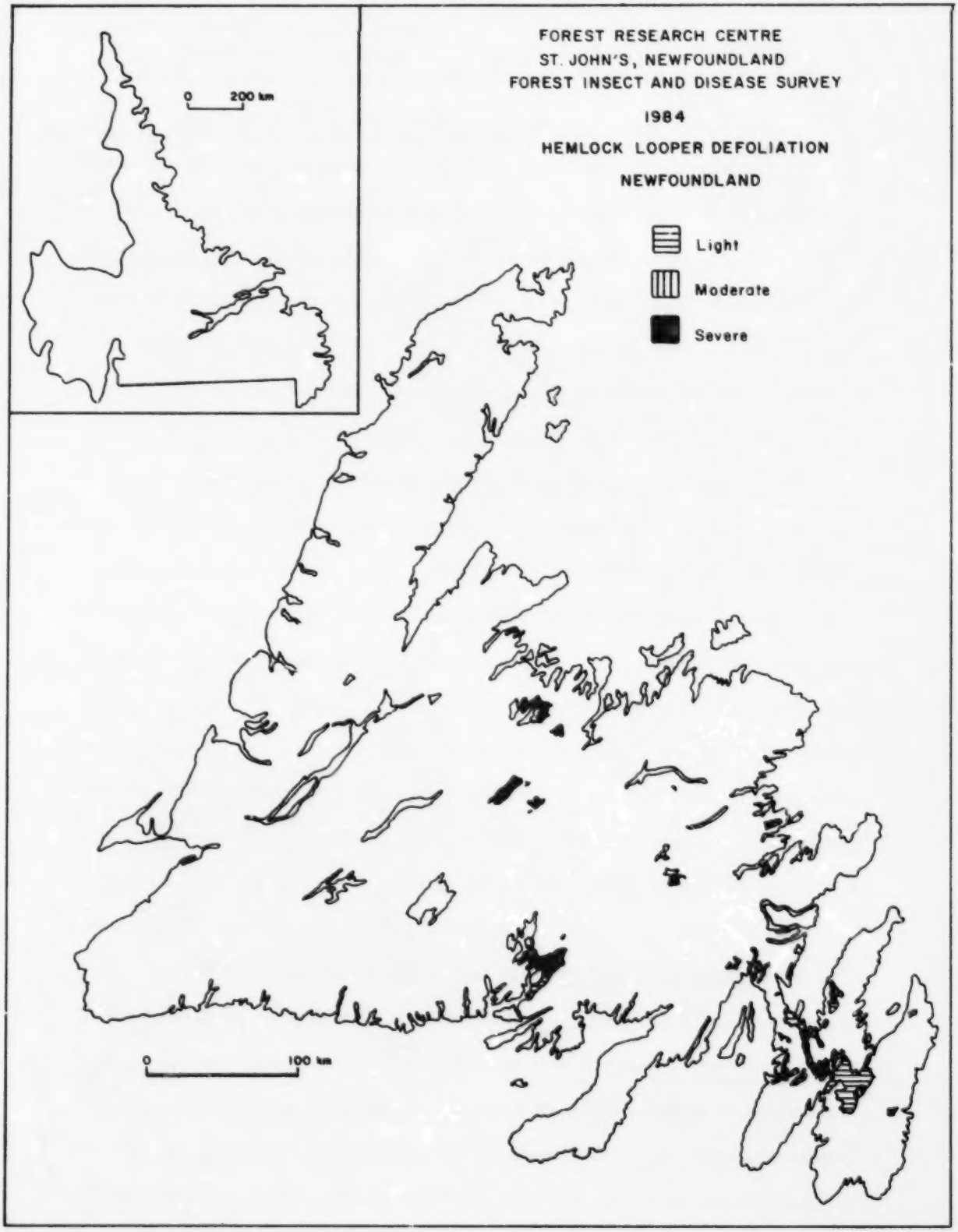

Figure 6. Areas of defoliation by the hemlock looper in Newfoundland in 1984.

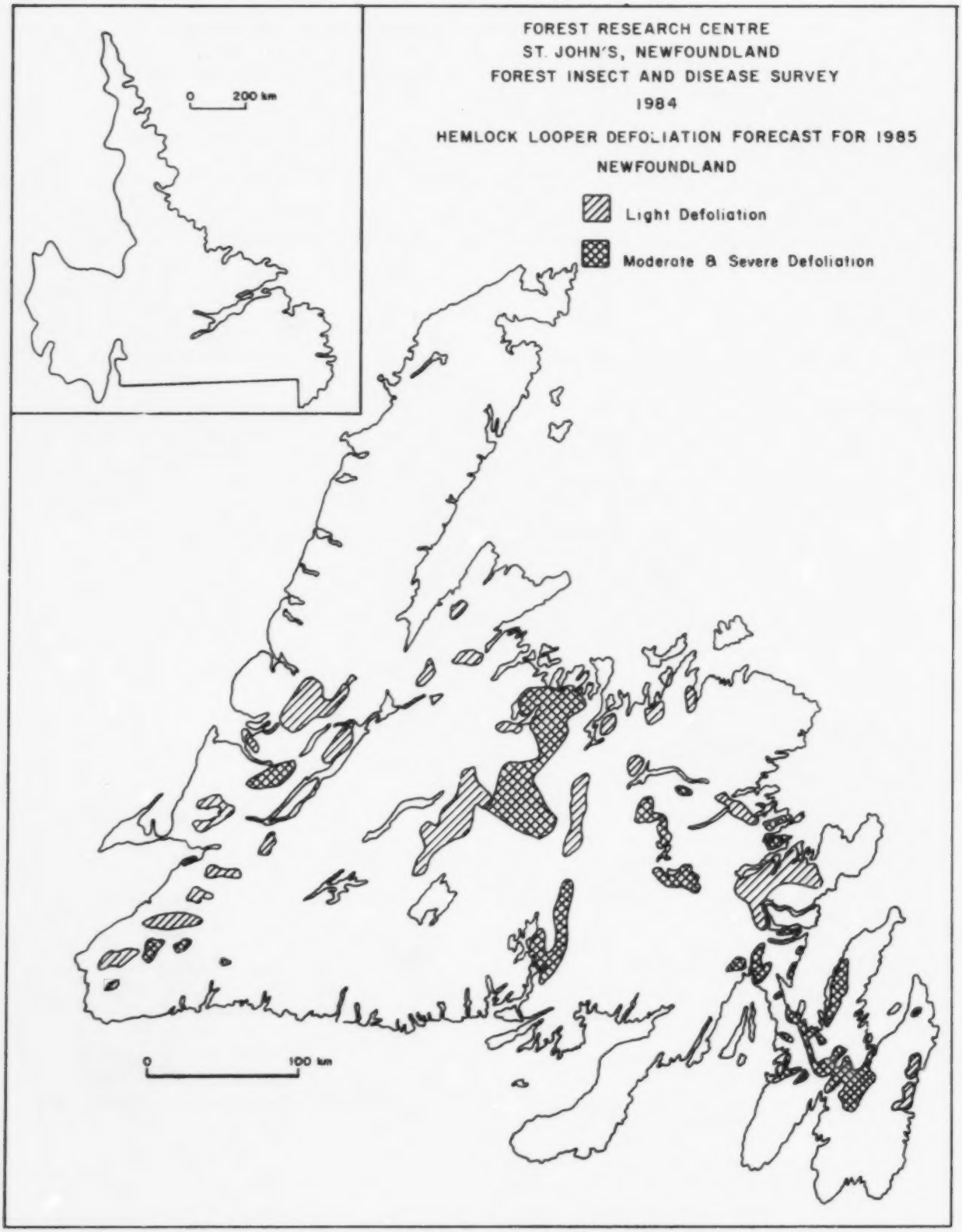

Figure 7. Areas of hemlock looper defoliation forecast for 1985 in productive forests of Newfoundland.

Armillaria Root Rot, Armillaria mellea (Vahl. ex Fr.) Kummer - The assessment of the role of Armillaria root rot in the mortality of black spruce stands previously defoliated by the spruce budworm was continued. The roots of young black spruce trees were exposed hydraulically and examined for Armillaria root rot in stands with moderate budworm damage near Great Rattling Brook. Results showed Armillaria was present in 14% of the living trees and in 4% of the dead trees for a total of 18% infection.

Balsam Woolly Aphid, Adelges picease (Ratz.) - A noticeable increase in tree damage has occurred in immature balsam fir along the Trans Canada Highway in recent years. Moderate to severely deformed crowns of trees are common and widespread from Robinsons River to the Jeffrey's Junction and from Crabbes River to 4 km west of the St. Fintan's Junction. Light damage occurred from Jeffrey's to Crabbes River. Prescribed burning implemented during the past few years by the Department of Forest Resources and Lands to remove young balsam fir stands killed by the spruce budworm also included some of the stands damaged by the balsam woolly aphid. These sites were planted with black spruce seedlings.

Four-eyed Spruce Bark Beetle, Polygraphus rufipennis (Kby.) - This beetle has been attacking black spruce stands that were weakened by the spruce budworm throughout central Newfoundland from Halls Bay to Port Blandford. The area of stands with more than 10% tree mortality reached about 97 000 ha in 1983 and another 100 000 ha had less than 10% mortality. Black spruce stands in several areas were examined annually to monitor beetle activity and assess the rate of tree mortality. The areas of tree mortality did not expand in 1984 and

the rate of mortality decreased from an average of 8.7% in 1983 to 4.5% in 1984. Recovery of trees with the production of new foliage was noticeable in many stands that were attacked by this bark beetle.

Spruce Bud Midge, Rhabdophaga swainei Felt - Damage by this insect was recorded in young black spruce and white spruce stands throughout the Island. Population levels were high in several locations and permanent plots were established near Gander, Halls Bay and Taylor's Brook to define the biology of this insect and determine the effect of damage on the growth of spruce. Light damage was also recorded in the Goose River Road in Labrador.

Spruce Beetle, Dendroctonus rufipennis (Kby.) - Population levels continued to rise with new areas of infestations being reported near Serpentine Lake and South Brook in western Newfoundland. Several areas of white spruce stands attacked in 1982 have scattered tree mortality.

Cone Insects - Collections of cones during the past three years have produced several species of insects that attack seed cones. Light to moderate damage of cone crops occurred this year in the Noel Paul's Brook, New Bay Lake and Aspen Brook areas. Light damage was also reported along the Churchill River Road. Most of the damage occurred on black spruce cones.

Yellowheaded Spruce Sawfly, Pikonema alaskensis (Roh.) - Population levels of this sawfly increased over the past three years throughout central Newfoundland. In 1984 larvae were more common and widespread in regeneration stands of mature black spruce and white

spruce from Bay d'Espoir to Gander Bay and along the coast to Lewisporte, near Botwood, Cottrell's Cove, Quinn Lake, New Bay Lake, Woodsdale Nursery and on the Baie Verte Highway, Hampden Road and near Howley. Defoliation was light between 5% to 20% and did little damage to trees. This sawfly usually causes most damage to regeneration stands.

Needle Rust of Conifers - Needle rusts of black spruce, Chrysomxa ledicola Lagerh. and C. empetri Schroet., and balsam fir, Pucciniastrum epilobii Otth. were common and widespread throughout the Province. A high incidence of infection on small black spruce occurred near Fairhaven Junction. A moderate incidence of the rust disease was observed at St. John's on white spruce where approximately 30% of the new foliage was affected and near Lewisporte where up to 25% of the new needles on ornamental blue spruce showed infection. There was also a moderate incidence of the disease on black spruce west of Howley Junction. At Pasadena, a low to moderate incidence of needle rust occurred on 20% of the new foliage of 25 year old balsam fir. On Sitka spruce, a low incidence was recorded as 10% of the needles were affected throughout a plantation near Mobile. Other localities of low incidence of rust on balsam fir included Goose River Road, Northwest River access road, southwest of Northwest River, Grand Lake road and Mary March Provincial Park.

Witches' Broom of Black Spruce, Arceuthobium pusillum Peck. - During the last two years a black spruce stand near Gambo was examined for the spread of dwarf mistletoe. Results showed that the mistletoe

continued to spread in the stand as one or more brooms formed on numerous spruce trees that previously had no visible symptoms of the disease. The trees ranged from 3 to 11 m in height and from 5 to 16 centimetres in diameter.

Eastern Blackheaded Budworm, Acleris variana (Fern.) - Low numbers of larvae were collected in the Codroy Valley, Corner Brook and Pasadena areas and no defoliation was recorded. Population levels of this insect and the spruce budmoth had been increasing during the past few years but severe frost and a snow storm during the growing season this year could have affected the small larvae.

Inland Spruce Cone Rust, Chrysomyxa pirolata Wint. - Low incidences of cone rust were recorded on black spruce regeneration near Burnt Berry Pond. In St. John's the disease was observed on ornamental white spruce. About 10% of the cones on a few trees were affected.

Shoot Blight of Black Spruce Seedlings, Sirococcus strobilinus Preuss - Sirococcus shoot blight was recorded on black spruce seedlings in the Wooddale Nursery but the incidence of the disease was low.

Black Army Cutworm, Actebia fennica (Tauscher) - The severe outbreak that occurred in the West Pond and Johnson's Lookout plantations in 1983 has collapsed. Only low populations were found feeding on pin cherry and fireweed in these areas in 1984. Collected and reared larvae showed a high percentage of disease caused by a fungal pathogen identified as Entomophthora sp.

Winter Drying - A high incidence of winter drying was observed on balsam fir near Southeast Brook on the Northern Peninsula where much of the foliage had turned reddish brown. Near Sally's Cove and south of Portland Creek Junction a low incidence was recorded on balsam fir with approximately 20% of the foliage affected.

Frost Damage - Record low temperatures experienced from June 16-26 caused severe frost damage to most softwood and hardwood species throughout the Island. A high incidence of late frost was recorded on black spruce and balsam fir throughout the Bonavista Peninsula and the Terra Nova National Park and affected mostly young roadside regeneration. In the Wooddale Nursery a moderate incidence of frost occurred on black spruce seedlings.

PINE AND LARCH PESTS

Scleroderris Canker of Pines, Gremmeniella abietina (Lagerb.) Morelet - This canker continued to spread in the St. John's and the Salmonier Line areas. Ornamental pine trees in some locations in St. John's had about 70% of the foliage affected. In addition several new infection sites were located in Bowring Park, the arterial road and one along the Salmonier Line. The infection on the Salmonier Line is the second record of the disease outside the quarantine zone established by the Department of Forest Resources and Lands. The pruning of infected trees continued in St. John's and the infected tree in the Salmonier Line was removed in an attempt to eradicate the disease in that area.

Larch Sawfly, Pristiphora erichsonii (Htg.) - A severe infestation of this sawfly was recorded for the second consecutive year from the Goulds to St. John's and along the Crosstown Arterial Road. Defoliation was recorded from 75-90%. Severe defoliation also occurred in small infestations near Whitbourne and Eastport.

Shrew trapping was conducted in the four plots throughout the Island in October. Results of this trapping are summarized in Table 6.

Larch Beetle, Dendroctonus simplex Lec. - Population levels of this beetle showed a slight decrease on the Avalon Peninsula but clumps of dying larch trees were common in central Newfoundland. In Labrador high population levels of this beetle caused some tree mortality in stands previously defoliated by the larch sawfly along the Churchill River Road. The beetle was also present in scattered larch trees from Gull Lake to Cartwright.

Needle Cast of Conifers, Lophodermium pinastri (Schrad. ex Hook) Chev. - A moderate incidence of needle cast of white pine was recorded on the Great Rattling Brook Road where up to 30% of the old foliage was affected. At the Canadian Forestry Service Arboretum, Bottom Brook a low incidence of this disease was observed on red and Scots pine as up to 10% of the pine had infection. Austrian pine was affected at the Wooddale Nursery with a moderate incidence being recorded.

Table 6. Estimated number of shrews per hectare in Newfoundland.

Location	October				
	1980	1981	1982	1983	1984
St. George's	10.77	12.69	4.30	10.77	2.15
Hall's Bay	3.24	4.83	6.45	4.30	6.45
Terra Nova	5.39	7.53	8.60	4.30	10.80
Paddy's Pond	4.30	2.15	5.39	3.24	5.39

DECIDUOUS TREE PESTS

Birch Casebearer, Coleophora serratella (L.) - Population levels of the casebearer remained high from the Avalon Peninsula to Gander, in the Springdale area and on the Baie Verte Peninsula. Light to moderate populations occurred throughout the remainder of the Island. Although the casebearer can completely defoliate white birch trees the insects rarely causes tree mortality.

Shoot and Leaf Blight of Trembling Aspen, Venturia macularis (Fr.) E. Muell & Arx. - Shoot and leaf blight of aspen continued to be common and widespread throughout the Island. A severe incidence of this disease occurred from Pasadena to Deer Lake. A moderate incidence occurred north of the Trans Canada Highway on the Baie Verte Highway :ere about 40% of shoots in 30% of the stand was damaged and east of Seal Cove, White Bay where up to 30% damage to 30% of the stand was observed. A low incidence was also recorded on silver poplar at Wedgewood Park and St. John's and on hybrid poplar at Grand Bank. In Labrador a high incidence occurred east of Happy Valley on regenerating aspen and a low incidence of this disease was recorded along the Churchill Falls Road, where 15% of the foliage was affected.

Birch Leafminer, Fenusa pusilla (Lep.) - Larvae of this insect were common and caused severe browning of foliage to roadside white birch from Badger to Codroy Pond. Only light damage was recorded from Badger east to St. John's. In Labrador infestations continued around the Goose Bay - Happy Valley area and along the highway from Otter Creek to Northwest River.

Black Knot of Cherry, Apiosporina morbosa (Schw.) Arx. des - This disease continued to be common and widespread throughout the Island. A high incidence of black knot occurred in the Humber Valley affecting from 50% to 70% of the trees. A moderate infection was recorded on the Goose River Road in Labrador. The disease was widespread but less prevalent in many other locations on the Island and Labrador.

Striped Alder Sawfly, Hemichroa crocea (Geoff.) - Infestations of this sawfly continued to expand in western Newfoundland and new infestations occurred in central Newfoundland. Severe defoliation of speckled alder occurred in the Stephenville area, Pinchgut Lake, along the Trans Canada Highway near Shellbird Island, and in the Gros Morne National Park. In central Newfoundland severe defoliation occurred near Badger, Mary Ann Lake, Barren Lake, South Pond, Davis Pond and South Brook, Halls Bay.

Satin Moth, Leucoma salicis (Linn.) - This insect continued to defoliate ornamental willow trees in the city of Corner Brook. Thirty percent defoliation and 20% branch mortality occurred at the Blomidown Golf course, and 30-70% defoliation was recorded near the Corner Brook paper mill.

Scab and Black Canker of Willows, Fusicladium saliciperdum (All. Tub.) Lind. and Physalospora miyabeana Fuk. - A high incidence of scab and black canker occurred on native willows from Stephenville to Deer Lake. A moderate incidence was recorded on laurel willow in Bannerman Park, St. John's. About 30% of the willows were affected. A low incidence of this disease was observed on native willows on the Churchill Falls Road in Labrador.

Gypsy Moth and Forest Tent Caterpillar, Lymantria dispar (Linn.) and Malacosoma disstria Hbr. - A survey was again conducted in 1984 in co-operation with Agriculture Canada to monitor any accidental introduction of these pests to the Province. Pheromone traps placed in camping parks and near major towns produced no gypsy moths. However, adult male forest tent caterpillars were found in traps across the Island.

OTHER INSECTS AND DISEASES

Newfoundland Region

Insect or disease	Host(s)	Locality	Remarks
Chrysomela falsa Brown willow leaf beetle	Willow	Baie Verte Peninsula	Low to high populations. Light to moderate damage
Chrysomyxa ledi de Bary Needle rust	Black spruce	Avalon Pen. eastern Labrador	Low to high incidence
Chrysomyxa ledicola Lagerh. Needle rust	Black spruce	Avalon Pen., Howley, eastern Labrador	Low to high incidence
Ciborinia whetzelii (Seav.) Seav. Ink spot	Trembling aspen	Eastern Labrador	Low to moderate incidence
Coleotechnites piceaella (Kft.) Orange spruce needleminer	Balsam fir Sitka spruce	Western Nfld.	Low populations
Dendroctonus reniculloides M. & M. Spruce coneworm	Black spruce White spruce	Western Nfld.	Low populations
Fenusa dohrnii (Tischb.) European alder leafminer	Speckled alder	Western and eastern Nfld.	Low to moderate populations. Light to moderate defoliation
Gilpinia hercyniae (Htg.) European spruce sawfly	White spruce Black spruce Sitka spruce Balsam fir	Throughout Island	Low populations
Hyphantria cunea (Drury) Fall webworm	Speckled alder	Western Nfld.	High populations

(cont'd.)

Continued.
Newfoundland Region

Insect or disease	Host(s)	Locality	Remarks
Kabatiella apocrypta (Ell. & Ev.) Arx. Anthracnose	Red maple	Pasadena Nursery	Low incidence to 100% of seedlings
Mindarus abietinus Koch. Balsam twig aphid	Balsam fir	Western and central Nfld.	Low to high populations
Neodiprion abietis complex Balsam fir sawfly	Balsam fir Black Spruce	Western Nfld. eastern Labrador	Low populations
Orgyia antiqua (L.) Rusty tussock moth	Balsam fir, black spruce, white spruce willow, white birch, tamarack speckled alder	Throughout Island	Low populations
Phyllocnistis populiella (Cham.) Poplar serpentine leafroller	Trembling aspen	Western Nfld. eastern Labrador	Low to high populations
Pristiphora geniculata (Htg.) Mountain ash sawfly	Mountain ash	Western and eastern Nfld.	Moderate populations
Pucciniastrum epilobii (Otth.) Needle rust	Balsam fir	Mary March Prov. Park eastern Nfld.	Low incidence
Rehmiellopsis balsamea Waterman Tip blight	Balsam fir	Markland, Pinchgut Lake Road	Moderate incidence
Venturia populina (Vuill.) Fabr. Leaf and shoot blight	Silver poplar	Pasadena, Deer Lake	Moderate to high incidence

(Cont'd.)

Concluded.
Newfoundland Region

Insect or disease	Host(s)	Locality	Remarks
Zeiraphera canadensis M. & F. Spruce bud moth	White spruce	Western Nfld.	Low populations
Zeiraphera improbana (Wlk.) Larch needle worm	Tamarack	Western and eastern Nfld.	Low populations